

CLIFFSIDE BRIDGE

(Cliff Bridge)

Acadia National Park Roads & Bridges

Spanning Jordan Ravine on Amphitheatre Carriage Road

Seal Harbor Vicinity

Hancock County

Maine

HAER NO. ME-43

HAER  
ME  
5-SEHA.V  
2-

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service

Department of the Interior

P.O. Box 37127

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CLIFFSIDE BRIDGE  
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HAER No. ME-43

LOCATION: Spanning ravine against cliff face of Jordan Ridge, 1 mile WSW of Jordan Pond House, on Amphitheatre section of Sargent Mountain carriage road between posts 14 and 21, Acadia National Park, Seal Harbor vicinity, Mount Desert Island, Hancock County, Maine

Quad: Southwest Harbor, ME  
UTM: 19/558700/4907150

DATE OF CONSTRUCTION: 1932

ARCHITECT: Charles W. Stoughton

ENGINEER: Charles Russell Atherton, design engineer  
Paul D. Simpson, field engineer

CONTRACTOR: Constructed by Rockefeller work crews under the direction of estate superintendent S. F. Ralston.

STRUCTURE TYPE: Asymmetrical segmental arch viaduct, reinforced concrete construction faced in native stone

FHWA STRUCTURE NO.: 1700-011S

SIGNIFICANCE: This bold stone bridge displays a castellated appearance from its crenelated parapets and projecting turrets or viewing platforms. The asymmetrical structure is constructed across a dry ravine on a cliff face, affording open views of the Jordan Stream valley.

PROJECT INFORMATION: Documentation of Cliffside Bridge is part of the Acadia National Park Roads and Bridges Recording Project, conducted in 1994-95 by the Historic American Engineering Record.

Richard H. Quin, HAER Historian, 1994

This is one in a series of reports prepared for the Acadia National Park Roads and Bridges Recording Project. HAER No. ME-43, ACADIA CARRIAGE ROADS, provides more specific information on the carriage road system.

#### HISTORY

One of the principal elements of John D. Rockefeller, Jr.'s carriage road system on Maine's Mount Desert Island is the 13-mile loop around Sargent, Penobscot and Cedar Swamp mountains. Although construction of the loop road began in the early 1920s, Rockefeller suspended construction of the southern section in 1924 in response to protests by a group of island summer residents that the road would desecrate The Amphitheatre, a wild and particularly scenic bowl-shaped valley separating Penobscot and Cedar Swamp mountains. Rockefeller did not resume the project until the early 1930s, when, convinced that the opposition to his work had diminished, he ordered the completion of the road, a vital link in his system.

The new road segment would have to be carried along a steep cliff face about a mile southwest of the Jordan Pond House. There was little room to construct the road out on benchwork or by other means, and to cross one ravine on this cliff section would require a major bridge. The site was already known to Rockefeller. A decade earlier, Acadia National Park superintendent George B. Dorr and Rockefeller's carriage road engineer at Seal Harbor, Paul D. Simpson, had discovered the cliff face while choosing the location for the road. Dorr was captivated by the challenge, and wrote Rockefeller with his recommendations.

I have spent a great deal of time at this point and think the difficulty can be solved by making a direct, wide-angled approach to the shelf, continuing the road-line from the east, and building an arch against the cliff which would span the foot path, instead of making a solid fill. . . . Such an arch. . . might be made a feature of interest or beauty and would leave the continuity of the cliff--itself a feature of great interest--as well as the climb unbroken.<sup>1</sup>

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<sup>1</sup>George W. Dorr, Superintendent, Lafayette National Park, to John D. Rockefeller, Jr., quoted in Vanasse Hangen Brustlin, Inc. and McGinley Hart & Associates, *Historic Bridge Reconnaissance*

Dorr's general suggestions were adopted. Known during planning and construction as Amphitheatre Bridge No. 3, the "Bluff Arch," the "Half Arch" or the "Cliff Bridge," the structure would carry the carriage road across the declivity. The structure would serve both as bridge and a viewing platform, affording extensive views of the Jordan Stream valley.

Rockefeller engaged New York architect Charles W. Stoughton to design the bridge. Stoughton had designed most of the smaller bridges in New York's Central Park and several bridges for the carriage road network at the Rockefeller's Pocantico Hills estate in New York's Hudson Valley, and was the architect for the later bridges on the Mount Desert system. The plans were prepared in summer 1931. Stoughton designed the structure and Charles Russell Atherton was the design engineer. Rockefeller received the plans in late July or early August and forwarded the elevations and working drawings to his carriage road engineer at Seal Harbor, Paul D. Simpson, on 7 August.<sup>2</sup>

Rockefeller had relied on Seal Harbor contractors Byron and Sam Candage to build most of his structures, but Candage's numerous cost overruns, some of them considerable, dissuaded him from using him for the last several carriage road bridges. Instead, he began using construction crews organized by his Seal Harbor estate superintendent, S. F. Ralston. The crews included stone cutters, masons and other laborers, including some men who had formerly worked for Candage or other Rockefeller contractors.

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*Study: Carriage Road Bridges, Acadia National Park, draft edition (Boston, MA: National Park Service, North Atlantic Regional Office, September 1993), 104.* The "foot-path" referred to by Dorr was part of the Jordan Ridge Trail, which dropped from Penobscot Mountain down to [Little] Long Pond on the Rockefeller estate. The southern two miles of the trail, including the segment at Cliffside Bridge, have been abandoned. The trail appears on old trail maps of the island.

<sup>2</sup>Charles W. Stoughton, "Bluff Arch on the Jordan Pond Road, Bridge No. 3, Mount Desert Estate of Mr. John D. Rockefeller, Jr. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group II, Homes (Seal Harbor), Box 118 Folder 1192; John D. Rockefeller, Jr., New York, to Paul D. Simpson, Seal Harbor, ME, 7 August 1931. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 4.

Paul D. Simpson, Rockefeller's carriage road engineer at Seal Harbor, was responsible for site planning and technical aspects of the work.

On 7 September 1931, Rockefeller authorized Ralston to expend a sum not to exceed \$5,000 for the construction of the Amphitheatre Bridge. He realized the bridge would cost considerably more and asked Ralston to make an estimate of the cost.<sup>3</sup>

The work was underway in the fall of 1931. In October, Ralston reported that crews would complete work on the nearby West Branch Jordan Stream Bridge [HAER No. ME-32], allowing him to put them onto the Cliff Bridge project. Already, the men were splitting large boulders for use in the structure, and were about to begin excavations for the abutments. Ralston warned that construction would prove difficult due to the rocky ledges and the limited space in which to work. He submitted the requested construction estimate, a sum of \$28,000 which would make it one of the most expensive structures on the system.<sup>4</sup>

In early April 1932, Paul Simpson reported that \$5,000 had been spent on construction but that a further estimate of \$28,000 had been submitted. Charles Stoughton had been paid \$200 towards his fees.<sup>5</sup> Four days later, Ralston wrote to state he had studied the site again would be able to reduce the estimated cost of the bridge to \$21,000. Construction could begin on 12 April, and Ralston estimated sixty working days would be required for the

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<sup>3</sup>John D. Rockefeller III, New York, to S. F. Ralston, Seal Harbor, ME, 29 June 1932. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group II, Homes (Seal Harbor), Box 121 Folder 1218.

<sup>4</sup>Ralston to Rockefeller, 27 October 1931. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group II, Homes (Seal Harbor), Box 121 Folder 1218.

<sup>5</sup>Simpson to Rockefeller, 4 April 1932. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group II, Homes (Seal Harbor), Box 100 Folder 1094.

work. Rockefeller wrote back to express his pleasure with the reduction in the original estimate.<sup>6</sup>

The work was pushed toward completion in the spring and summer. By 1 June, \$9,437.15 had been spent on the project. Ralston reported on 2 July that the bridge was "well along" and that he hoped to have it completed in the next thirty days. Expenditures now totalled \$14,916.13 and Ralston felt confident it could be completed within the limits of the \$21,000 estimate.<sup>7</sup>

On 22 July, engineer Simpson reported to Stoughton that work on the bridge was "making good progress" and that the structure would be completed in about three weeks. The lower wall was completed nearly to the height of the parapet, and the "character" of the stone work reflected Stoughton's instructions given on his last visit.<sup>8</sup>

The bridge was completed in late summer. In early September, Rockefeller wrote Stoughton to note he had chosen a large stone panel in one of the circular balconies for the location for a date stone. He added a few remarks to indicate his appreciation for the bridge.

I think the half arch bridge a most robust, interesting and handsome structure, and am much pleased with it. It is different and very attractive. It will look much better when the road surface is filled up to its normal height so the bridge will not look so deep.<sup>9</sup>

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<sup>6</sup>Ralston to Rockefeller, 7 April 1932; Rockefeller to Ralston, Seal Harbor, ME, 11 April 1932. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group II, Homes (Seal Harbor), Box 110 Folder 1094.

<sup>7</sup>Ralston to John D. Rockefeller, III, New York, 2 July 1932. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group II, Homes (Seal Harbor), Box 121 Folder 1218.

<sup>8</sup>Simpson to Charles W. Stoughton, New York, 22 July 1932. Rockefeller Archives Center, Simpson Family Papers, Record Group IV3A10, Box 1 Folder 5.

<sup>9</sup>Rockefeller to Stoughton, 3 September 1932. Rockefeller Archives Center, Office of the Messrs. Rockefeller, Record Group

Rockefeller did express surprise that the finished bridge had a width of only 16', when Stoughton had convinced him to build the other recent bridges with a 20' width, presumably wide enough for two carriages to pass. Rockefeller told Stoughton he thought the Cliffside Bridge should have been built to the wider width as well, but conceded that the architect may have designed the span with a narrower width so as not to require a cut into the bank. At any rate, he congratulated Stoughton on the bridge.<sup>10</sup>

Cliffside Bridge has remained in continuous use, and is appreciated by the thousands of hikers, cyclists and horse and carriage riders who pass over the road, pausing at the bridge to take in the breathtaking view. The structure is also the focal point of a popular park interpretive program on the Rockefeller carriage road bridges.

A 1993 inspection by Vanasse Hangen Brustlin, Inc., a Boston structural engineering firm, noted a number of problems with the structure. The inspection report noted cracking and delamination of the exposed concrete arch intrados, calcium carbonate deposition on the intrados and bridge walls, extensive mortar joint deterioration, and rubble which had fallen from the ledge against the upper face of the bridge. The study recommended remedial measures including waterproofing the roadway to divert water off the structure, repair of the concrete delamination, repointing of the entire bridge, removal of the calcium carbonate efflorescence, and removal of the debris which had lodged against the bridge.<sup>11</sup> The work had not been carried out in 1995, when the bridge was documented.

#### DESCRIPTION

Cliffside Bridge is a bold structure, its reinforced concrete substructure concealed by rough-hewn random ashlar granite. The semicircular half-arch structure is distinguished by its crenelated parapet and by two projecting "turrets" or viewing platforms. This battlemented appearance evokes the feel of a medieval fortification. The turrets encourage those crossing the

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2, Homes (Seal Harbor), Box 123 Folder 1243.

<sup>10</sup>Ibid.

<sup>11</sup>Vanasse Hangen Brustlin and McGinley Hart, 105-106.

bridge to tarry and take in a magnificent view of the Jordan Stream valley with the Jordan Pond House in the near distance.<sup>12</sup>

The structure is a filled spandrel arch structure arrayed around a single segmental arch. The 242' structure is built on a tangent against a steep cliff face, and the upper northwest or upper side of the bridge is set into and against the ledge. The 50' span arch is asymmetrical, its northern side rising from a lower spring line. The arch stands 12'6" above the generally dry ravine. To either side of the arch on the valley side are battered stone viewing platforms or lookouts. On the inner face of the southern turret is a date stone marked 1932.

The 16' roadway is flanked by crenelated stone parapet walls which terminate in large rectangular stone blocks which suggest smaller towers to either side of a fortified gate. The structure is faced in large, irregular dark grey granite blocks, adding to the foreboding appearance. The reinforced concrete substructure is not visible except for the underside or intrados of the arch. This concrete was left exposed because few people were liable to view the bridge from below.

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<sup>12</sup>This description is based on the account in Vanasse Hangen Brustlin and McGinley Hart, page 104, and field reconnaissance in summer 1995.



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